

CLAIMS

1. A method of purifying exhaust gas of an internal combustion engine comprising steps of:

5 disposing a NOx occluding and reducing catalyst in an exhaust gas passage of the internal combustion engine to selectively occlude and hold NOx in the exhaust gas by adsorption, by absorption or by both of them when the air-fuel ratio of the exhaust gas flowing in is lean, and to reduce the occluded NOx with
10 reducing components in the exhaust gas when the air-fuel ratio of the exhaust gas flowing in becomes the stoichiometric air-fuel ratio or a rich air-fuel ratio; and

15 causing said catalyst to occlude the NOx in the exhaust gas from the engine when the engine is operated at a lean air-fuel ratio, and purifying the NOx occluded by said catalyst by reduction with reducing components in the exhaust gas from said engine when the engine is operated at the stoichiometric air-fuel ratio
20 or at the rich air-fuel ratio;

wherein a sulfur-solidifying agent that forms a solid sulfate upon the reaction with SOx at the time of combustion is supplied to the engine to solidify the SOx in the exhaust gas thereby to prevent the SOx in
25 the exhaust gas from being occluded by the NOx occluding and reducing catalyst, and the amount of supplying said sulfur-solidifying agent to the engine is controlled depending upon the condition of the atmosphere at said catalyst.

30 2. A method of purifying exhaust gas of an internal combustion engine as set forth in claim 1, wherein said sulfur-solidifying agent is supplied to the engine in a decreased amount or is not supplied when the condition of the atmosphere at said NOx occluding and
35 reducing catalyst is one for suppressing the occlusion of SOx by the NOx occluding and reducing catalyst.

3. A method of purifying exhaust gas of an

internal combustion engine as set forth in claim 1,
wherein said sulfur-solidifying agent is supplied to the
engine in a decreased amount or is not supplied when the
condition of the atmosphere of said NOx occluding and
5 reducing catalyst is one for promoting the SOx occluded
by the NOx occluding and reducing catalyst to be released
from the NOx occluding and reducing catalyst.

4. A method of purifying exhaust gas of an
internal combustion engine comprising steps of:

10 disposing a NOx occluding and reducing
catalyst in an exhaust gas passage of the internal
combustion engine to selectively occlude and hold NOx in
the exhaust gas by adsorption, by absorption or by both
of them when the air-fuel ratio of the exhaust gas
15 flowing in is lean, and to reduce the occluded NOx with
reducing components in the exhaust gas when the air-fuel
ratio of the exhaust gas flowing in becomes the
stoichiometric air-fuel ratio or a rich air-fuel ratio;
and

20 causing said catalyst to occlude the NOx
in the exhaust gas from the engine when the engine is
operated at a lean air-fuel ratio, and purifying the NOx
occluded by said catalyst by reduction with reducing
components in the exhaust gas from said engine when the
25 engine is operated at the stoichiometric air-fuel ratio
or at the rich air-fuel ratio;

wherein a sulfur-solidifying agent that
forms a solid sulfate upon the reaction with SOx at the
time of combustion is supplied to the engine to solidify
30 the SOx in the exhaust gas thereby to prevent the SOx in
the exhaust gas from being occluded by the NOx occluding
and reducing catalyst, and the amount of supplying said
sulfur-solidifying agent to the engine is controlled
depending upon the operating condition of the engine.

35 5. A method of purifying exhaust gas of an
internal combustion engine as set forth in claim 4,
wherein said sulfur-solidifying agent is supplied to the

engine in a decreased amount or is not supplied when said internal combustion engine is operated under a condition of suppressing the occlusion of SOx by the NOx occluding and reducing catalyst.

5 6. A method of purifying exhaust gas of an internal combustion engine as set forth in claim 4, wherein said sulfur-solidifying agent is supplied to the engine in a decreased amount or is not supplied when said internal combustion engine is operated under a condition
10 of promoting the SOx occluded by the NOx occluding and reducing catalyst to be released from the NOx occluding and reducing catalyst.

 7. A method of purifying exhaust gas of an internal combustion engine as set forth in claim 4,
15 wherein said sulfur-solidifying agent is supplied to the engine in a decreased amount or is not supplied when said internal combustion engine is operated under a condition of promoting the formation of deposit in the engine due to said sulfur-solidifying agent.

20 8. A method of purifying exhaust gas of an internal combustion engine as set forth in claim 4, wherein said sulfur-solidifying agent is supplied to the engine in a decreased amount or is not supplied when said internal combustion engine is operated under a condition
25 of promoting the occurrence of knocking due to the addition of said sulfur-solidifying agent.

 9. A method of purifying exhaust gas of an internal combustion engine as set forth in claim 4,
30 wherein said sulfur-solidifying agent is supplied to the engine in a decreased amount or is not supplied when the knocking has occurred in said internal combustion engine.

 10. A method of purifying exhaust gas of an internal combustion engine comprising steps of:
35 disposing a NOx occluding and reducing catalyst in an exhaust gas passage of the internal combustion engine to selectively occlude and hold NOx in the exhaust gas by adsorption, by absorption or by both

of them when the air-fuel ratio of the exhaust gas
flowing in is lean, and to reduce the occluded NOx with
reducing components in the exhaust gas when the air-fuel
ratio of the exhaust gas flowing in becomes the
5 stoichiometric air-fuel ratio or a rich air-fuel ratio;
and

causing said catalyst to occlude the NOx
in the exhaust gas from the engine when the engine is
operated at a lean air-fuel ratio, and purifying the NOx
10 occluded by said catalyst by reduction with reducing
components in the exhaust gas from said engine when the
engine is operated at the stoichiometric air-fuel ratio
or at the rich air-fuel ratio;

wherein a sulfur-solidifying agent that
15 forms a solid sulfate upon the reaction with SOx at the
time of combustion is supplied to the engine to solidify
the SOx in the exhaust gas thereby to prevent the SOx in
the exhaust gas from being occluded by the NOx occluding
and reducing catalyst, and the amount of supplying said
20 sulfur-solidifying agent to the engine is controlled
depending upon the NOx occluding capability of said NOx
occluding and reducing catalyst.

11. A method of purifying exhaust gas of an
internal combustion engine as set forth in claim 10,
25 wherein when the NOx occluding capability of said NOx
occluding and reducing catalyst becomes lower than a
predetermined value, said sulfur-solidifying agent is
supplied to the engine in an increased amount or the
supply thereof is started.